

Constant-roll inflation in $f(T)$ teleparallel gravity

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Abstract

© 2018 IOP Publishing Ltd and Sissa Medialab. We investigate in detail the implications of the constant-roll condition on the inflationary era of a scalar field coupled to a teleparallel $f(T)$ gravity. The resulting cosmological equations constitute a reconstruction technique which enables us to find either the $f(T)$ gravity which corresponds to a given cosmological evolution, or the Hubble rate of the cosmological evolution generated by a fixed $f(T)$ gravity. We also analyze in some detail the phase space of the constant-roll teleparallel gravity and we discuss the physical significance of the resulting fixed points and trajectories. Also we calculate the observational indices of a theory with given $f(T)$ gravity, and we discuss all the implications of the constant-roll condition on these. As we demonstrate, the resulting theory can be compatible with the current observational data, for a wide range of values of the free parameters of the theory.

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Keywords

Cosmic singularity, cosmological perturbation theory, inflation, modified gravity

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